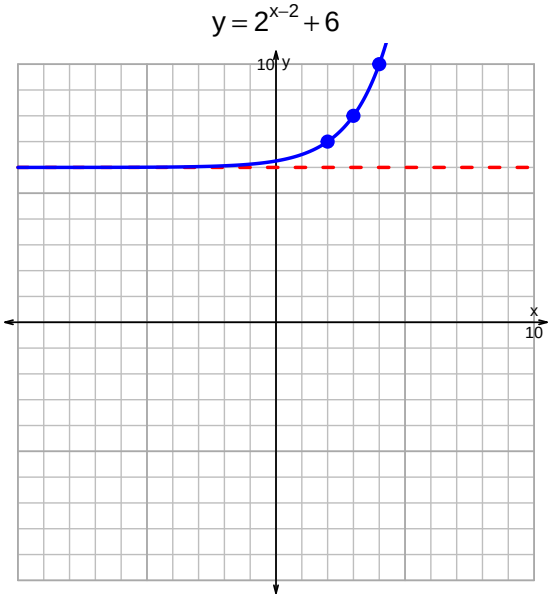
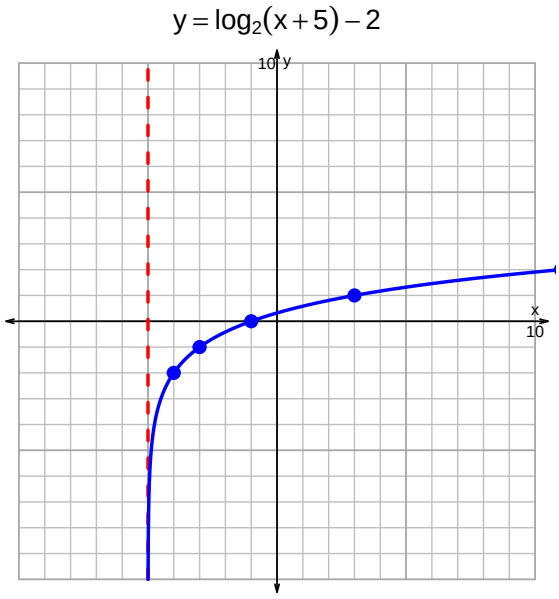
Name: Date:

s18: EXP LOG (SLTN v356)

1. (10 pts) Graph $y = 2^{x-2} + 6$ and $y = \log_2(x+5) - 2$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-17 = \left(\frac{-4}{7}\right) \cdot 2^{3t/5}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{17 \cdot 7}{4} = 2^{3t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{17 \cdot 7}{4}\right) = \frac{3t}{5}$$

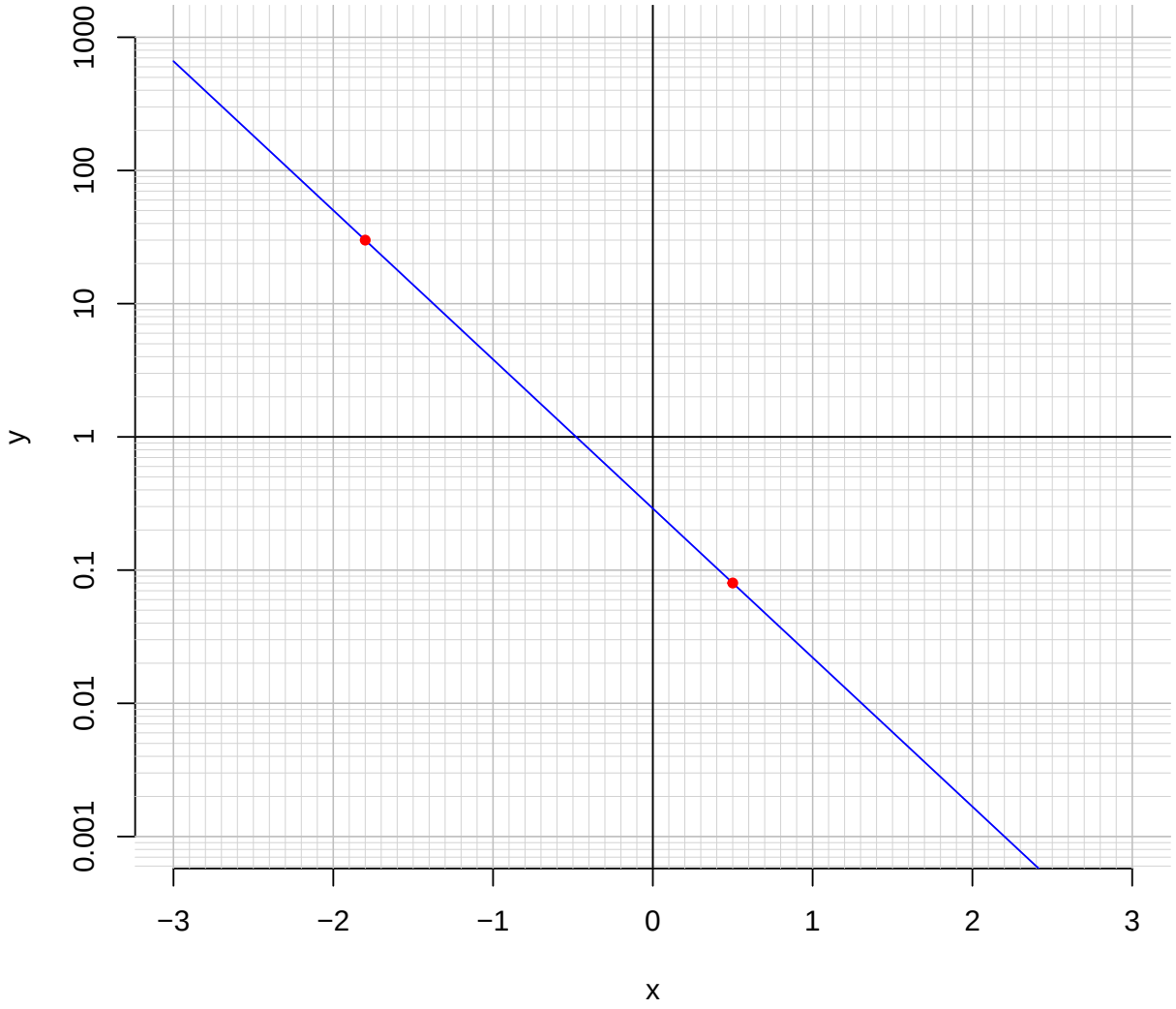
Divide both sides by $\frac{3}{5}$.

$$\frac{5}{3} \cdot \log_2\left(\frac{17 \cdot 7}{4}\right) = t$$

Switch sides.

$$t = \frac{5}{3} \cdot \log_2\left(\frac{17 \cdot 7}{4}\right)$$

3. (10 pts) An exponential function $f(x) = 0.29 \cdot e^{-2.58x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-1.8)$.

$$f(-1.8) = 30$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{2.58} \cdot \ln\left(\frac{x}{0.29}\right)$$

Using the plot above, evaluate $f^{-1}(0.08)$.

$$f^{-1}(0.08) = 0.5$$